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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,978	11/14/2003	Tatsuya Arao	0756-7219	7501

31780 7590 10/05/2006

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EXAMINER

BOOTH, RICHARD A

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 10/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/706,978	<b>Applicant(s)</b> ARAO ET AL.	
	<b>Examiner</b> Richard A. Booth	<b>Art Unit</b> 2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 18 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/18/06 has been entered.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Kensaku, JP 11-204433 in view of Tanaka et al, U.S. 2003/0031214, Tanabe, U.S. Patent 6,642,091 and Akram et al., U.S. Patent 5,925,410.

Kensaku shows the invention as claimed including a method for fabricating a semiconductor device comprising: forming a semiconductor film having an amorphous structure over a substrate; and irradiating the semiconductor film with an excimer laser

beam in a linear or rectangular shape while applying ultrasonic vibration to the substrate to crystallize the semiconductor film (see (57) Summary in page 1 of translation).

Kensaku is applied as above but does not expressly disclose floating the substrate, holding the substrate using a chuck, applying the ultrasonic vibration to the substrate through the chuck, and wherein the substrate is floated by the chuck holding the end portion. Tanaka et al. discloses holding a substrate over a stage having pores, spouting gases from the pores to float the substrate, and holding an end portion of the substrate (see, for example, paragraph 0088). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Kensaku so as to hold the substrate as disclosed by Tanaka et al. because such a method allows for adequate controlled crystallization of the semiconductor film.

Regarding the use of a chuck, Tanabe discloses a substrate being held on a substrate holding unit by means of a chuck (see col. 12-lines 27-30). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Kensaku modified by Tanaka et al. so as to hold the substrate using a chuck because in such a way accurate positioning of the substrate can be obtained. With respect to running the ultrasonic vibration through the chuck, Akram et al. discloses imparting ultrasonic vibration to a substrate by running the vibration through the chuck (see col. 5-lines 8-28). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Kensaku modified by Tanaka et al. and Tanabe so as to run

the ultrasonic vibration through the chuck because Akram et al. shows that such a method is a suitable way in which an ultrasonic vibration can be applied to a substrate.

Furthermore, Kensaku, Tanaka et al., Tanabe, and Akram et al. are applied as above but do not expressly disclose wherein the semiconductor device is used for a display device selected from the claimed group. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Kensaku so as to use the semiconductor device in one of the claimed display devices because it is well known to those of ordinary skill in the art that semiconductor devices are commonly used in these display devices.

Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kensaku, JP 11-204433 in view of Tanaka et al, U.S. 2003/0031214, Tanabe, U.S. Patent 6,642,091 and Akram et al., U.S. Patent 5,925,410 as applied to claims 1-7 above, and further in view of Chae, U.S. Patent 5,432,122.

Kensaku, Tanaka et al., Tanabe, and Akram et al. are applied as above but do not expressly disclose crystallizing while overlapping a beam spot of the laser beam on the film.

Chae discloses overlapping a beam spot of lasers (see abstract). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Kensaku modified by Tanaka et al. and Tanabe and Akram et al. so as to scan so as to overlap beam spots on the film because such a method will allow for the manufacture of a high mobility transistor.

Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kensaku, JP 11-204433 in view of Tanaka et al, U.S. 2003/0031214, Tanabe, U.S. Patent 6,642,091 and Akram et al., U.S. Patent 5,925,410 as applied to claims 1-7 above, and further in view of Liu et al., U.S. Patent 5,147,826.

Kensaku, Tanaka et al., Tanabe, and Akram et al. are applied as above but do not expressly disclose crystallizing the semiconductor film by adding a metal element such as nickel for enhancing a crystallization.

Liu et al. discloses adding a metal element for enhancing a crystallization of a semiconductor film (see abstract and col. 4-lines 21-34). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Kensaku modified by Tanaka et al. and Tanabe and Akram et al. so as to add a metal element to the semiconductor film because in such a way crystallization can be achieved at a lower temperature.

Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kensaku, JP 11-204433 in view of Tanaka et al, U.S. 2003/0031214, Tanabe, U.S. Patent 6,642,091, Akram et al., U.S. Patent 5,925,410 and Chae, U.S. Patent 5,432,122 as applied to claims 11-13 above, and further in view of Liu et al., U.S. Patent 5,147,826.

Kensaku, Tanaka et al., Tanabe, Akram et al., and Chae are applied as above but do not expressly disclose crystallizing the semiconductor film by adding a metal element for enhancing a crystallization.

Liu et al. discloses adding a metal element for enhancing a crystallization of a semiconductor film (see abstract and col. 4-lines 21-34). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Kensaku modified by Tanaka et al., Tanabe, Akram et al., and Chae so as to add a metal element to the semiconductor film because in such a way crystallization can be achieved at a lower temperature.

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kensaku, JP 11-204433 in view of Tanaka et al, U.S. 2003/0031214, Tanabe, U.S. Patent 6,642,091 and Akram et al., U.S. Patent 5,925,410 as applied to claims 1-7 above, and further in view of Kusumoto et al., U.S. Patent 6,027,960.

Kensaku, Tanaka et al., Tanabe, and Akram et al. are applied as above but do not expressly disclose irradiating the semiconductor film in an oxygen atmosphere.

Kusumoto et al. discloses laser annealing in an oxygen atmosphere (see col. 10-lines 21-26). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Kensaku modified by Tanaka et al. and Tanabe and Akram et al. so as to perform laser annealing in an oxygen atmosphere because the crystallinity will be improved.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-21 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A. Booth whose telephone number is (571) 272-1668. The examiner can normally be reached on Monday-Thursday from 7:30-6:00.

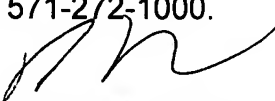
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on (571) 272-1873. The fax phone



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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Richard A. Booth  
Primary Examiner  
Art Unit 2812

September 29, 2006